

## DRAFT rule revisions for 6/4/2019 Rule Development Meeting

Comments on this draft may be sent to [DNRRNR700input@wisconsin.gov](mailto:DNRRNR700input@wisconsin.gov).

Subject matter (group/subgroup): Soil Standards

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Changes (include treatment, list in order of rules):

### NR 720.12 is amended to read:

NR 720.12 Procedures for determining residual contaminant levels based on protection of human health from direct contact with contaminated soil.

(1) GENERAL. If a responsible party selects this option, residual contaminant levels for soil based on protection of human health from direct contact shall be developed using the following criteria:

(a) For individual carcinogenic polycyclic aromatic hydrocarbons, with the exception of naphthalene, compounds using an excess cancer risk of  $1 \times 10^{-65}$  and a hazard quotient for non-carcinogens of one; and

(am) For all other individual compounds using an excess cancer risk of  $1 \times 10^{-6}$  and a hazard quotient for non-carcinogens of one.

(b) The cumulative risk posed by all individual compounds will not pose a significant direct contact risk.

~~(b) The cumulative excess cancer risk will not exceed  $1 \times 10^{-5}$  and the hazard index for non-carcinogens will not exceed one for the site or facility.~~

### NR 720.12(3) is amended to read:

720.12 (3) DEFAULT EXPOSURE ASSUMPTIONS. (a) *Non-carcinogens*. When the contaminant is not a carcinogen, the following default exposure assumptions shall be used:

1. When the land use of a site or facility is classified as non-industrial, in accordance with s. NR 720.05 (5), all of the following shall apply:

a. The variables  $IR_{res-c}$  (soil intake rate – child) mg/day,  $BW_{res-c}$  (body weight – child) kg,  $EF_{res-c}$  (exposure frequency – child) days/year,  $SA_{res-c}$  (skin surface area – child)  $cm^2$ /day,  $AF_{res-c}$  (skin adherence factor – adult) mg/ $cm^2$ , PEF (particulate emission factor)  $m^3$ /kg, and  $ED_{res-c}$  (exposure duration – child) years, referenced in b. to e. are equivalent to those used by the EPA to calculate Regional Screening Levels (RSLs).

Note: Standard default factors used by the U.S. Environmental Protection Agency to calculate RSL are provided at <https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide>

~~a-b.~~ Incidental ingestion of soil shall be assumed to occur at a child's soil intake rate of  $IR_{res-c}$  the rate of 200 mg of soil per day -for a child with a body weight of 15 kg  $BW_{res-c}$  - with an exposure frequency of  $EF_{res-c}$ .

~~b-c.~~ Dermal absorption of soil shall be determined assuming a child's daily exposed skin surface area of  $SA_{res-c}$  2,800  $cm^2$  with a skin-soil adherence factor of  $AF_{res-c}$  0.2 mg/ $cm^2$  and a contaminant specific dermal absorption fraction.

~~c-d.~~ Inhalation of outdoor soil vapors shall be assumed to occur for each volatile contaminant at a 24-hour daily exposure rate determined by the volatile's soil-to-air volatilization factor, and inhalation of particulate matter shall be determined assuming a particulate emission factor of  $PEF$  of  $1.43 \times 10^9$   $m^3$ /kg.

~~d-e.~~ An averaging period for exposure shall equal the default child exposure duration  $ED_{res-c}$  of 6 years.

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2. When the land use of a site or facility is classified as industrial, in accordance with s. NR 720.05 (5), all of the following shall apply:

a. The variables  $IR_w$  (soil ingestion rate - composite worker) mg/day,  $BW_w$  (body weight - composite work) kg,  $EF_w$  (exposure frequency - composite worker) day/yr,  $SA_w$  (surface area - composite worker)  $cm^2/day$ ,  $AF_w$  (skin adherence factor - composite worker) mg/cm<sup>2</sup>, PEF (particulate emission factor) m<sup>3</sup>/kg, and  $ED_w$  (exposure duration - composite worker) yr, referenced in b. to e. are equivalent to those used by the EPA to calculate "Regional Screening Levels (RSLs).

ab. Incidental ingestion of soil shall be assumed to occur at the rate of ~~100 mg of soil per day~~  $IR_w$  for an ~~70 kg adult worker with a body weight of  $BW_w$  for 250 days each year~~ an exposure frequency of  $EF_w$ .

bc. Dermal absorption of soil shall be determined assuming an adult outdoor worker's daily exposed skin surface of  ~~$SA_w$  3,300  $cm^2$~~  with a skin-soil adherence factor of  $AF_w$  and a contaminant specific dermal absorption fraction.

cd. Inhalation of outdoor soil vapors shall be assumed to occur for each volatile contaminant at an 8-hour daily exposure rate determined by the volatile contaminant's soil-to-air volatilization factor, and inhalation of particulate matter shall be determined assuming a particulate emission factor of ~~1.43  $\times 10^9$  m<sup>3</sup>/kg~~ PEF.

de. An averaging period of exposure shall equal the default exposure duration of  ~~$ED_w$  25 years~~.

(b) *Carcinogens*. When the contaminant is a carcinogen, the following default exposure assumptions shall be used:

1. When the land use of a site or facility is classified as non-industrial, in accordance with s. NR 720.05 (5), all of the following shall apply:

a. The variables  $IRS_{res-c}$ ,  $EF_{res}$  (exposure frequency) days/year,  $ED_{res-c}$   $BW_{res-c}$ ,  $IRS_{res-a}$  (soil intake rate - adult),  $ED_{res-a}$  (exposure duration - adult) years,  $BW_{res-a}$  (body weight - adult) kg,  $SA_{res-c}$ ,  $AF_{res-c}$ ,  $SA_{res-a}$  (skin surface area - adult)  $cm^2/day$ ,  $AF_{res-a}$  (skin adherence factor - adult) mg/cm<sup>2</sup>,  $ET_{res-c}$  (child exposure time), hours/day, PEF,  $ED_{res}$  (exposure duration) years, and LT (lifetime) years, referenced in b. to e. are equivalent to those used by the EPA to calculate "Regional Screening Levels (RSLs).

ab. Incidental ingestion of soil shall be assumed to occur at the ~~child soil intake rate of 200 mg of soil per day~~  $IRS_{res-c}$  for an exposure frequency of  ~~$EF_{res}$  350 days each year~~ for the child exposure duration of  ~~$ED_{res-c}$  6 years~~ for a child of body weight  ~~$BW_{res-c}$  for a 15 kg child~~ and at the ~~adult soil intake rate of 100 mg per day~~  $IRS_{res-a}$  for an exposure frequency of  ~~$EF_{res}$  350 days each year~~ for the adult exposure duration of  ~~$ED_{res-a}$  24 years~~ for an adult of body weight  ~~$BW_{res-a}$  70 kg adult~~.

bc. Dermal absorption of soil shall be determined assuming a child's daily exposed skin surface area of ~~2,800  $cm^2$~~   $SA_{res-c}$  with a skin-soil adherence factor of ~~0.2 mg/cm<sup>2</sup>~~  $AF_{res-c}$ , and an adult's daily exposed skin-surface area of  ~~$SA_{res-a}$  5,700  $cm^2$~~  with a skin-soil adherence factor of  ~~$AF_{res-a}$  0.07 mg/cm<sup>2</sup>~~ and a contaminant specific dermal absorption fraction.

cd. Inhalation of outdoor soil vapors shall be assumed to occur for each volatile contaminant at a 24-hour daily exposure rate determined by the volatile contaminant's soil-to-air volatilization factor, and inhalation of particulate matter shall be determined assuming a particulate emission factor of ~~PEF 1.43  $\times 10^9$  m<sup>3</sup>/kg~~. For mutagenic contaminants, age segmented exposure durations shall be assumed when age adjusted cancer slope factors are available.

de. An averaging period of ~~30 years of exposure duration~~  $ED_{res}$  consisting of  ~~$ED_{RES-C}$  6 child years~~ and  ~~$ED_{RES-A}$  24 adult years~~ shall be assumed during a ~~70 year~~ lifetime of LT.

2. When the land use of a site or facility is classified as industrial, in accordance with s. NR 720.05 (5), all of the following shall apply:

a. The variables  $IR_w$ ,  $EF_w$ ,  $BW_w$ ,  $SA_w$ ,  $AF_w$ ,  $ET_w$  (exposure time - composite worker) hr, PEF,  $ED_w$ , and LT referenced in b. to e. are equivalent to those used by the EPA to calculate "Regional Screening Levels (RSLs). Incidental ingestion of soil shall be assumed to occur at the

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rate of ~~IR<sub>w</sub> 100 mg of soil per day~~ for a duration of ~~EF<sub>w</sub> 250 days each year~~ for an adult worker with a body weight of BW<sub>w</sub> 70 kg adult worker.

cb. Dermal absorption of soil shall be determined assuming an adult outdoor worker's daily exposed skin surface of ~~SA<sub>w</sub> 3,300 cm<sup>2</sup>~~ with a skin-soil adherence factor of ~~AF<sub>w</sub> 0.2 mg/cm<sup>2</sup>~~ and a contaminant specific dermal absorption fraction.

de. Inhalation of outdoor soil vapors shall be assumed to occur for each volatile contaminant at an 8-hour daily exposure rate determined by the volatile contaminant's soil-to-air volatilization factor, and inhalation of particulate matter shall be determined assuming a particulate emission factor of ~~1.43 x 10<sup>9</sup> m<sup>3</sup>/kgPEF.~~

ed. An averaging period of ~~ED<sub>w</sub> 25 years of exposure~~ shall be assumed during a ~~70 year~~-lifetime of LT.

### Plain language explanation/analysis:

The excess cancer risk used to calculate the RCL for these PAH compounds could be increased from  $1 \times 10^{-6}$  to  $1 \times 10^{-5}$ , effectively increasing the current RCL by a factor of 10. In addition, the RCL calculator will no longer calculate RCLs for the protection of groundwater for PAH compounds (except for naphthalene); this will be noted within NR 720. This proposal will result in an increase to the DC RCLs in Wisconsin for these compounds.

Also, the current Wis. administrative code lists a specific threshold value of  $1 \times 10^{-5}$  that represents an unacceptable level of cumulative risk. The rule will be revised to require that cumulative risk be assessed, however a specific target value will no longer be listed.

The department has determined that the default exposure assumptions (body weight, exposure duration, particulate emission factor, etc.) used to calculate residual contaminant levels at a cleanup site should be equivalent to those used by the EPA to calculate regional screening levels (RSLs). Section NR 720.12(3) defines these values. To avoid having to change the administrative code every time the EPA changes one of their default assumptions, the DNR is proposing to reference the variables used by the RSL calculator as opposed to referencing numeric values. The rule would include a note that would refer to the EPA Regional Screening Levels (RSLs) webpage to find the current value for each variable.

### Comparable state or federal rules or policies:

The [white paper](#) on this topic, introduced at the April 9, 2019, Rule Development Meeting, provides a detailed explanation of how these changes compare to other states.

### Economic impact comments:

It is expected that an increase in the RCL for polycyclic aromatic hydrocarbons (PAHs) will likely reduce the number of sites where a site investigation under ch. NR 716 and a remedial action will be required by the department. The amount of soil that contains PAHs that could be managed as exempt soil without department review and approval is also expected to increase. This should result in cost savings for property owners, developers, municipalities, and utilities who cleanup and redevelop properties with PAH-impacted soil. This change will likely reduce the workload of the RR program as certain sites will not require site investigations and cleanups or the scope of the response actions will be smaller in size, but the number of sites regulated by the DNR is not expected to change.